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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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Shin-Tai Lo

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EXAMINER

LUI, DONNA V

ART UNIT

PAPER NUMBER

2629

DATE MAILED: 11/01/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 10/665,534	Applicant(s) LO ET AL.	
	Examiner Donna V. Lui	Art Unit 2629	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 16 August 2006.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-6 is/are pending in the application.
- 4a) Of the above claim(s) is/are withdrawn from consideration.
- 5) ☐ Claim(s) is/are allowed.
- 6) ☒ Claim(s) 1-6 is/are rejected.
- 7) ☐ Claim(s) is/are objected to.
- 8) ☒ Claim(s) are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. .
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. <u> </u> |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date <u> </u> | 6) <input type="checkbox"/> Other: <u> </u> |

DETAILED ACTION

Claim Objections

1. **Claim 1** is objected to because of the following informalities: grammatical errors. The following is a suggestion for correction.

Claim 1, lines 13-14: “a switching element having a gate that connects to the gate of the writing ~~element~~; element and a source that connects to the data line;”

Claim 1, lines 17-18: “a control element having a gate that connects to the scan ~~line~~; line, and a source that connects to the line ~~enable~~; enable, and a drain that connects”

Appropriate correction is required.

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. **Claims 1-6** are rejected under 35 U.S.C. 103(a) as being unpatentable over Okuda (Pub. No.: US 2002/0135309 A1) in view of Libsch et al. (Patent No.: US 6,310,594 B1).

With respect to **Claim 1**, Okuda teaches a current driving apparatus for an active matrix organic electroluminescent element (*See figure 4; [0056]; [0057], lines 1-5*) comprising: a data line (*element 34: IS1*); a scan line (*wiring line common to element 45: TR2 and element 46: TR3*); a common line (*ground*); a supply line (*element 38*); a writing element (*element 45:TR2*)

Art Unit: 2629

having a source that connects to the data line; a switching element (*element 46: TR3*) having a gate that connects to the gate of the writing element and a source that connects to the data line; a driving element (*element 32: TR1*) having a gate that connects to the drain of the writing element and a source connects to the supply line; a storage element (*element 33: C1*) having two ends, one connected to the source of the driving element and the other end connected to the connection of the gate of the driving element and the drain of the writing element; and a light emission element (*element 31: EL1*) having two ends, one end being the positive electrode that connects to the drain of the driving element, and the other end being the negative electrode that connects to the common line.

Okuda does not teach a current driving apparatus for an active matrix organic light emitting diode which utilizes two abutting sub-pixels, the two abutting sub-pixels being an odd sub-pixel and an even sub-pixel, the abutting sub-pixels sharing a data line, a scan line, and a common line, the driving apparatus of each sub-pixel comprising: a line enable, the line enable being an odd line enable for the odd sub-pixels and an even line enable for the even sub-pixels; and a control element having a gate that connects to the scan line, a source that connects to the line enable and a drain that connects to the gate of the switching element.

Libsch teaches a driving apparatus for an active matrix pixel display (*column 1, lines 46-47*) which utilizes two abutting sub-pixels (*See figure 1, pixels 1 and 2*), the two abutting sub-pixels being an odd sub-pixel (*pixel 1; column 5, lines 5-6*) and an even sub-pixel (*pixel 2; column 5, lines 5-6*), the abutting sub-pixels sharing a data line (*column 4, lines 48-51*) and a scan line (*column 4, lines 25-28*), the driving apparatus of each sub-pixel comprising: a line enable, the line enable being an odd line enable for the odd sub-pixels and an even line enable

Art Unit: 2629

for the even sub-pixels (*column 4, lines 32-34; column 5, lines 3-7*); a data line (*See figure 1*); a scan line (*See figure 1, element EN*); a writing element (*See figure 1, elements M2, M4, M6, and M8*) having a source that connects to the data line; a control element (*See figure 1, element M1, M3, M5, and M7*) having a gate that connects to the scan line (*element EN*) and a source that connects to the line enable (*ROW (k+1), ROW (k+3), ..., ROW (k+m): odd lines; ROW (k), ROW (k+2), ..., ROW (k+n): even lines*); and a storage element (*See figure 1, element CS1, CS2, CS3, and CS4*) having two ends, one end connected to the drain of the writing element.

Libsch modifies the current driving apparatus of Okuda such that the circuit of Okuda (*Okuda: See figure 4*) uses an additional transistor (*Libsch: See figure 1, element M1*) to control the writing element (*Okuda: See figure 4, element 45: TR2*), through the use of a line enable (*Libsch: ROW (k+1), ROW (k+3), ..., ROW (k+m): odd lines; ROW (k), ROW (k+2), ..., ROW (k+n): even lines*), in effect controlling the switching element (*Okuda: See figure 4*). The modification is such that the gate of element M1 of Libsch is connected to the scan line of Okuda and the drain of element M1 of Libsch is connected to the gate of the writing element of Okuda. Because both of the gates of the writing element and the switching element of Okuda are connected to the scan line, the modification results in a control element having a gate that connects to the scan line, a source that connects to the line enable, and a drain that connects to the gate of the switching element. The modification results in an arrangement of pixels where columns of pixels are alternately even and alternately odd, having a similar odd and even arrangement as shown in figure 1 of Libsch.

It would have been obvious for a person of ordinary skill in the art at the time the invention was made to have two abutting sub-pixels, the two abutting sub-pixels being an odd

Art Unit: 2629

sub-pixel and an even sub-pixel, the abutting sub-pixels sharing a data line, a scan line, and a common line, the driving apparatus of each sub-pixel comprising: a line enable, the line enable being an odd line enable for the odd sub-pixels and an even line enable for the even sub-pixels; and a control element having a gate that connects to the scan line, a source that connects to the line enable and a drain that connects to the gate of the switching element, as taught by Libsch to the current driving apparatus of Okuda so as to increase an aperture area for pixels in an array (*Libsch: column 4, lines 28-29*), provides a 2:1 data demultiplexing function (*Libsch: column 4, lines 48-51*), and implementing the multiplexing functions from circuitry implemented within the pixel rather than from circuitry at the data or gate line ends (*Libsch: column 4, lines 3-6*).

Neither Okuda nor Libsch teach a current driving apparatus for an active matrix organic light emitting diode. However, it is well known that an electroluminescent display is also called an organic EL display or an organic light emitting diode. It would have been obvious for a person of ordinary skill in the art at the time the invention was made to have a current driving apparatus that comprises a light emitting diode in the current driving apparatus of Okuda as modified by Lisch so as to have a greater range of applicability.

With respect to **Claim 2**, the current driving apparatus of claim 1, Okuda teaches the writing element is a transistor, however it would have been obvious for a person of ordinary skill in the art at the time the invention was made to use a writing element that is a thin film transistor, as taught by Okuda in the current driving apparatus for higher reliability and faster response.

With respect to **Claim 3**, the current driving apparatus of claim 1, Okuda teaches the

Art Unit: 2629

switching element is a transistor, however it would have been obvious for a person of ordinary skill in the art at the time the invention was made to use a writing element that is a thin film transistor, as taught by Okuda in the current driving apparatus for higher reliability and faster response.

With respect to **Claim 4**, the current driving apparatus of claim 1, Okuda teaches the driving element is a thin film transistor (*[0057], lines 5-6*). It would have been obvious for a person of ordinary skill in the art at the time the invention was made to use a driving element that is a thin film transistor, as taught by Okuda in the current driving apparatus for higher reliability and faster response.

With respect to **Claim 5**, the current driving apparatus of Okuda as modified by Libsch of claim 1, teaches the control element is a thin film transistor (*Libsch: column 4, lines 9-10*).

With respect to **Claim 6**, the current driving apparatus of claim 1, Okuda teaches the storage element is a storage capacitor (*[0057], lines 8-13*).

Response to Arguments

3. Applicant's arguments with respect to claims 1-6 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

4. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Donna V. Lui whose telephone number is (571) 272-4920. The examiner can normally be reached on Monday through Friday 8:30 a.m. - 5:00 p.m..

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Amr Awad can be reached on (571)272-7764. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Art Unit: 2629

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Donna V Lui
Examiner
Art Unit 2629

AMR A. AWAD
SUPERVISORY PATENT EXAMINER

A handwritten signature in black ink, appearing to read "Amr A. Awad", with a stylized flourish extending to the right.